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NOTES ON GEOGRAPHIC DISTRIBUTION

Tunicata, Thaliacea, Pyrosomatidae, *Pyrosomella verticillata* (Neumann, 1909): First record from the southwest Atlantic Ocean.

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The Order Pyrosomatida is composed by holoplanktonic colonial tunicates that produce bioluminescent flashes (Metcalf and Hopkins 1919). Because of their high rate of consumption, these organisms produce very large quantities of fecal pellets and play an important role in the flux of organic carbon in the marine ecosystem (Esnal 1999). The species are free-swimming tubular colonies of numerous zooids embedded in a common transparent test, with their branchial (incurrent) apertures around the outside of the colony and the atrial (excurrent) apertures opening into the central cavity, which opens to the outside by a posterior cloacal aperture (Dario 2005).

Pyrosomes occur in warm and temperate waters of all oceans, but the distribution of species is little known because of their erratic occurrence in plankton samples (Esnal 1999).

Soest (1981) completed a critical revision of the taxonomy of this group, and proposed a single family (Pyrosomatidae) subdivided into two subfamilies, three genera, and eight species. The species *Pyrosomella verticillata* (Neumann, 1909), *P. operculata* (Neumann, 1908), *Pyrosoma aherniosum* Seeliger, 1895, *P. ovatum* Neumann, 1909, and *P. atlanticum* Péron, 1904 belongs to the subfamily Pyrosomatinae; and *Pyrostremma spinosum* (Herdman, 1888), *P. agassizi* (Ritter and Byxbee, 1905), and *P. godeauxi* (Soest, 1981) to the subfamily Pyrostremmatinae.

According to the review of Soest (1981), five species occur in the South Atlantic Ocean: *P. atlanticum*, *P. aherniosum*, *P. ovatum*, *P. spinosum*, and *P. agassizi*. *Pyrosoma atlanticum* is the commonest and best known member of the family Pyrosomatidae. It is recorded as occurring between 50° N and 50° S in the Atlantic, Pacific, and Indian oceans (Soest 1981; Angel 1989; Esnal 1999; Palma and Apablaza 2004). *Pyrosomella verticillata* is restricted to warm Indo-West Pacific waters and to the connection between the Atlantic and Indian oceans at South Africa, near the Cape of Good Hope (Soest 1981; Esnal 1999). The occurrence of this species off the coast of Rio de Janeiro is reported for the first time herein, which expands its distribution to the southwest Atlantic Ocean.

Zooplankton was collected by vertical hauls, from near the bottom to the surface, using a cylindrical-conical net of mesh size 200 µm and mouth diameter of 60 cm, fitted with a calibrated flowmeter. Samples were fixed and preserved in 4 % buffered formalin diluted with seawater.

In the laboratory, the zooplankton samples were sorted and the pyrosomes separated. The colony was aqueous-stained with Rose Bengal, to facilitate observation of taxonomic structures. The identification was based on the descriptions of Soest (1981) and Esnal (1999). The voucher specimens of *P. verticillata* are deposited in the Thaliacea collection of the Integrated Laboratory of Zooplankton and Ichthyoplankton of the *Universidade Federal do Rio de Janeiro*. The photographs are original, based on the collected material.

A colony of *P. verticillata* was found of northern state of Rio de Janeiro (22°43'34.4" S, 40°41'36.3" W), in tropical water, temperature 19.69 °C, and salinity 36.40. The local depth was 110 meters. The colony is round, with a soft, colorless colonial wall. There is one large individual and several smaller ones of a similar size, with development of one budding in its stolon (Figure 1).

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Ascidiozooids have a round shape and luminous organs located immediately below the oral siphon. The oral siphon is very short, almost indiscernible, and the cloacal siphon is short. The branchial basket occupies almost the entire body space. The endostyle is located in the base of pharynx, behind the branchial basket (Figure 2). The species *Pyrosoma atlanticum* is the most abundant in waters of South Atlantic Ocean. This species differ of *P. verticillata*, principally, in the shape and the size of oral siphon.

Pyrosoma atlanticum colonies are cylindrical and finger-shapes and the zooids have oral siphon more elongated (Figure 3). In zooids of *P. verticillata* the oral siphon is close to the pharynx. According to Soest (1981), the genus *Pyrosomella* became extinct in the Atlantic Ocean after Miocene times during a period of low ocean temperatures, and was confined to tropical Indo-Pacific waters. Therefore, this new record of a colony of *P. verticillata* off the Brazilian coast extends its distribution to the southwest Atlantic Ocean.

Figure 1. View of *Pyrosomella verticillata* colony.

Figure 2. Ascidiozooid detail.

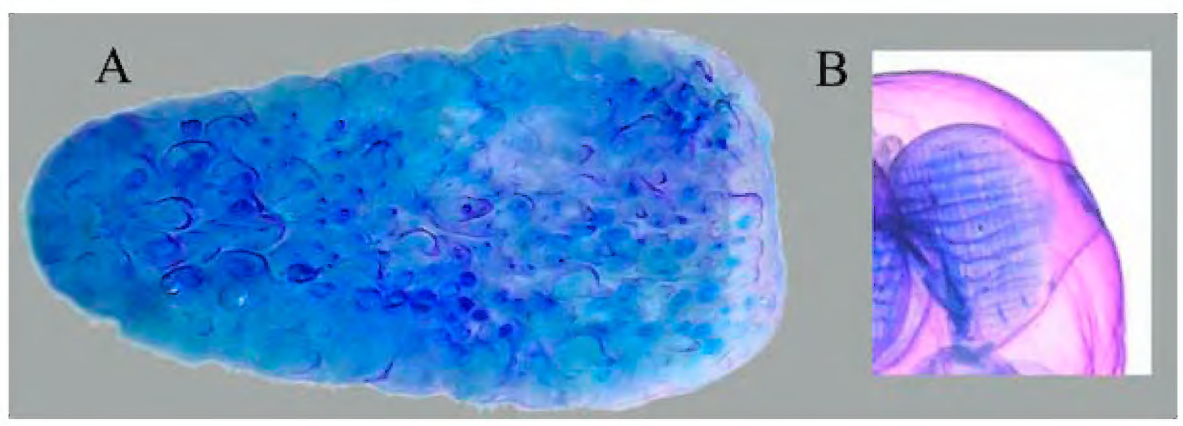

Figure 3. A, view of *Pyrosoma atlanticum* colony, with 6 cm of length; B, ascidiozooid detail, with 5 mm of diameter. The specimens are stained with methylene blue.

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